Volume 33 | Number 3 Article 6

1953

An Atomic Future

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THROUGH THE RADIO and the public press we have all been made keenly aware of the extremely destructive power of nuclear energy. The devastating effects of a nuclear explosion have been graphically depicted in terms of miles of influence, millions of dollars, months of time and multitudes of human lives.

We have been awed by its potentialities; but this is not new, for the sudden release of a large amount of energy whenever it occurs is awesome. The power of a tidal wave spreading destruction over thousands of acres, a volcano spewing molten lava across the countryside or a tornado destroying virtually everything in its path are all evidences of the release of energy in vast quantities. These are spectacular events and they command immediate public attention. Because they are newsworthy, we emphasize their destructiveness and are prone to forget that the same basic forces of nature when controlled as they can be controlled, may be extremely beneficial.

The future

The time has arrived for us to look at the rest of the picture, to learn more about the remarkable possibilities of nuclear power for the betterment of living and to see what it can do constructively for us and why.

Basically, it can be made to do virtually anything that any other source of energy can because it is only energy. One outstanding feature of nuclear energy is that an enormous amount of it can be released from a small quantity of material. One can store energy in different amounts, in many different materials and control the release of that energy. For example, one may store energy in a rubber band and release it. The amount of energy released may be sufficient to propell a wad of paper across the room or, expressed in slightly different terms, it is sufficient to burn a 100-watt electric light slightly less than 1/100 of a second. From a pound of coal or a gallon of gasoline we know how to release enough energy to burn the same 100-watt light over 42 hours. In contrast with these examples, the 100-watt light could be made to burn (if it doesn't burn out) 129 million hours or 14,700 years on the energy that we know how to release from a pound of uranium fuel. Thus from a lump of nuclear fuel approximately the size of a golf ball, there may be developed as much as can be obtained from 30 fifty-ton cars of coal. Actually, the total energy available in a pound of uranium is more than 1,000 times this amount, but we have not yet learned how to release all of it.

Obvious use

One obvious use of atomic energy is in the generation of electric power, and this possibility is receiving industrial attention at the present time. Five different groups of power companies, planning in conjunction with engineering firms, have proposed designs for nuclear power plants. The decision of how soon and how many of these plants will be built is up to the government.

One interesting feature of the production of nuclear power is that one of the by-products may be used to convert materials that are not nuclear fuels into materials that can be used as nuclear fuels. Thus it may be possible to produce in the nuclear power plant as much fuel as is being consumed in the plant. When nuclear fuel is used, it produces three things. One of these is heat that may be used to produce steam to drive turbines and electric generators; another is the "ashes" or fission products of the reaction; and the third is the nuclear invisible radiation.

This radiation is similar in certain respects to the radiation coming from the sun, but it is much more penetrating. Practically all of us have experienced sun burn as a result of over-exposure. The effects usually develop several hours after the exposure. Frequently there is no warning of the over-exposure and not much can be done about it afterward. A similar situation exists with respect to the nuclear radiation.

Extremely penetrating

Since nuclear radiation is extremely penetrating and its effects are serious, a nuclear power plant must be surrounded by a thick layer of material that will stop the radiation in order to protect individuals in the vicinity. These radiation shields are often built of concrete and may be as much as several feet thick. Thus, the radiation coming from the nuclear power plant tends to inhibit the use of this energy source for power production in small quantities. Consequently, the use of nuclear power for automobiles does not seem feasible. Nuclear power for ships, submarines and aircraft has been considered and for some of these applications, power plants are under construction. The use of nuclear power for locomotives may also be a possibility.

On the other hand, the radiation in controlled amounts may be put to highly beneficial uses. Already radiation and radioactive materials are important tools in medical, agricultural and industrial research. Their use in large quantities in industry appears to be not far away. There are far too many applications to discuss, but one that might be mentioned because of the difference it could make in some aspects of our everyday living is the use of radiation in sterilization of food.

Spoilage of food which occurs as a result of bacterial action is conventionally stopped by one of two methods. Food may be placed in a closed container and heated to a temperature that will kill the bac-

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teria. This treatment often impairs flavor, but it does prevent spoilage. The second technique for preventing spoilage is that of freezing. While this reduces the change in palatibility in comparison with sterilization by heat, it also produces adverse effects in some foods.

The foregoing are only a few examples of the many beneficial uses of nuclear energy. We cannot use it for the good of mankind if we fear it, but with a healthy respect for its characteristics and an appreciation of its potentialities, we can make its beneficial effects far outweigh the other effects which have unfortunately received so much publicity. With our understanding and our imagination we can develop it into a powerful tool for doing good.

Our Most Experienced Frosh

Prof. Beveridge

by Millie Willet

Home Economics Sophomore

SHE'S NEW at Iowa State along with all the freshmen but actually with a two-month head start.

Now filling the position of department head of Household Equipment is Professor Elizabeth Beveridge. She arrived at Iowa State this summer, making "home" at 1020 Roosevelt here in Ames. The summer months were spent mainly in getting acquainted, with a program of teaching and counseling stretched before her this fall.

Previous to this time Miss Beveridge was with the Bureau of Human Nutrition and Home Economics under the Department of Agriculture in Washington, D. C. Her work there dealt in research in house design, house spacing and kitchen equipment. This research led to her part in the publication of research bulletins.

Studies at ISC

Born in Illinois but raised in Colorado, Miss Beveridge completed her formal education and entered college with plans for a chemistry major. Realizing a vocation in home economics, she then followed in this path, receiving her degree in Home Economics Education from the Colorado A & M College in Fort Collins, Colo. She taught for a few years in Colorado junior and senior high schools. Coming then to Iowa State College, she began work on a masters degree in household equipment. After completing this work, she went to New York City where she remained for 13 years as home equipment editor for the Woman's Home Companion.

Lots of travel and wide experience have brought her back to Iowa State College where she starts a new career as Professor Elizabeth Beveridge, head of the Department of Household Equipment in the Division of Home Economics.